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Can Psycholinguistics Inform Second Language Learning? Educational Implications Arising from the Shared Asymmetrical Model

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Abstract

The representation of the bilingual lexical memory has been investigated with increased interest in recent years. Many studies have been devoted to the exploration of how two languages are stored in the mind of a language user. Despite the focus on this topic, we are far from reaching a cohesive conclusion. Several conflicting arguments and models have been proposed. Evidence supporting both shared and separate/distributed representations is available. A number of distinct memory models have been put forward, e.g. the Distributed Feature Model (de Groot, 1992), the Revised Hierarchical Model (Kroll & Stewart, 1994), the Sense Model (Finkbeiner et al., 2004), the Shared Asymmetrical Model (Dong et al., 2005), and the Modified Hierarchical Model (Pavlenko, 2009). This, in turn, led to a situation where psycholinguists conduct research but do not use the findings to inform education; more specifically they do not apply findings to second language learning. Therefore this paper explores the applicability of one memory model, namely the Shared Asymmetrical Model (Dong et. al., 2005) to second language learning. It is demonstrated in this review that it is possible to use differing methods of language instruction for teaching: (1) concepts that are shared between two languages/cultures, (2) concepts that are language/culture specific, and (3) for strengthening the link between the lexical representations of second language and the conceptual representations. The overarching goal of this review is to demonstrate that laboratory findings from psycholinguistic investigations can be applied to natural settings such as second language teaching/learning environment.

Keywords: bilingual lexical memory, second language learning, the Shared Asymmetrical Model, educational implications, conceptual representation

Introduction

Little attention in the psycholinguistic literature has been paid to the implications of language processing findings to the educational context. That is, the various models of the bilingual lexical memory have not been translated into e.g. second language leaning. In general, psycholinguists have focused on carrying out research rather than using the results to inform education. This situation might have arisen due to the scope of findings available,

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inconsistencies between the findings, and difficulties in interpreting them uniformly. In the last sixty years, many different lexical memory frameworks have been proposed e.g. the Distributed Feature Model (de Groot, 1992), the Revised Hierarchical Model (Kroll & Stewart, 1994), the Sense Model (Finkbeiner et al., 2004), the Shared Asymmetrical Model (Dong et al., 2005), and the Modified Hierarchical Model (Pavlenko, 2009), among others. There are certain similarities between them - many have hierarchically organised lexical and conceptual levels of representation. However, the structures differ too, especially when it comes to the theoretical assumptions regarding the conceptual level. For example, the proponents of the Revised Hierarchical Model claim that the conceptual level is a fully overlapping store, whereas the remaining models propose some level of distribution. Although it is difficult to make any conclusive remarks regarding the bilingual lexical memory structure and its applicability to educational context, this study deals with the 'messiness of bilingualism' (Pavlenko, 2011) and considers several possible scenarios of how one of the models, the Shared Asymmetrical Model (Dong et al., 2005) can inform education. Nevertheless, before describing the model and the rationale behind its selection, it is necessary to present the operational definition of bilingualism and in this way try to decrease the number of contradictory findings reported in the field of bilingualism (Grosjean, 1998).

It can be a daunting task to define what is meant by bilingualism. Apart from the fact that bilinguals use more than one language in their everyday life, they differ with regard to numerous other elements. Age of acquisition, context and purpose of language use, bicultural experience, education and literacy in both languages introduce a lot of variability and make it hard to describe bilinguals as a homogeneous group. Therefore, a single definition has to be broad enough to allow for a classification of vast array of bilingual individuals. A definition proposed by Grosjean (1998) seems to be the best available candidate. According to the researcher, the term *dominant bilingualism* describes the majority of bilinguals as few are equally fluent in both linguistic systems. This is because language history, language stability, or linguistic experiences of different languages are experienced asymmetrically by individuals. That is, these particular features, referred to as *complementarity principles*, greatly impact on the nature of individual linguistic abilities. Thus, in Grosjean's opinion, bilinguals are "those people who use two (or more) languages (or dialects) in their everyday lives" (Grosjean, 1998, p. 132). This definition does not make a distinction between modes of acquisition or context of language use; it simply denotes regular use and a certain level of communicative competence (Francis, 1999). Its simplicity seems to capture the concept of

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bilingualism very precisely. Furthermore, *bilingualism* is seen by the author of this review as a dynamic and multidimensional construct that cannot be described in straightforward categorical terms (Luk & Bialystok, 2013) but is perceived as a continuum (Grosjean & Li, 2013). Hence, conceptual information, i.e. information relating to the meaning of words is also seen as dynamic in nature, possible to undergo change and reconstructuring as a result of second language learning experience (Pavlenko, 2009).

The way in which bilinguals store their two languages in memory has been depicted by numerous memory models. Many of the models present the two languages as being separate on a lexical level (orthography, phonology) but shared or partially shared on a conceptual level. For instance, the proponents of the Revised Hierarchical Model (Kroll & Stewart, 1994) assume a shared conceptual level of representation between first language (L1) and second language (L2), whereas most other available models propose a degree of distribution at this level. One of the frameworks that presents the conceptual information as distributed is the Shared Asymmetrical Model (SAM) developed by Dong et al. (2005). The SAM (Figure 1) also assumes the existence of two separate lexical stores, one for each language, i.e. L1 and L2 (with L2 being smaller than that of L1 as it is assumed to contain less information). This model encapsulates the notion of common conceptual elements and language/culture specific elements in a form of one large store that is shared and two separate relatively smaller stores of L1 and L2 specific conceptual items. The different sizes of the stores are suggested as these researchers assume that "for the great majority of translation equivalents, the magnitude of their common conceptual elements is much greater than their language or cultural specific elements" (Dong et al., 2005, p. 233). Furthermore, the connections between the conceptual and lexical stores are complex and vary in strength.

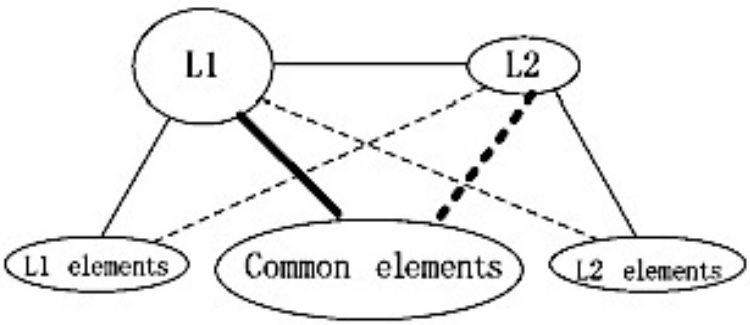

Figure 1. The Shared Asymmetrical Model (Dong et al., 2005, p. 233).

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The model was chosen for evaluation in this study because it presents a dynamic view, which accounts for common, as well as L1 and L2 specific conceptual elements. The proponents of the model, Dong et al. (2005) used the concept of the colour *red* to exemplify that translation equivalents apart from sharing common elements also retain language specific elements. More specifically, they explained that a common element between Chinese and English would be the concept of the 'colour' *red* and *hóngsè* (红色), whereas the concept of 'danger,' 'alert,' 'passion' would be more pronounced in the English word *red* than in the Chinese word *hóngsè* (红色) and the concept of 'bride,' 'good fortune,' 'prosperity' would be more salient in Chinese *hóngsè* (红色) than in English *red* (Dong et al., 2005, p. 233). The SAM accurately captures the notion of bilingual conceptual representation. Nevertheless, the implications of this model have not been extended beyond psycholinguistic investigation of language processing and representation. There is a distinct gap between theory and practice which can be limiting. The representation of shared and language/culture specific concepts in bilingual memory could have an impact on the ways in which those concepts are learnt. In case of shared concepts, the phonology and orthography have to be acquired, whereas in case of language/culture specific concepts, one also has to acquire the semantic piece of information about a given word or phrase. Therefore, the following aspects of the SAM's applicability to second language learning (SLL) instruction should be considered: (1) teaching/learning vocabulary that shares or partially shares concepts between the L1 and L2, (2) teaching/learning vocabulary that has language/culture specific meaning, and (3) strengthening the interlexical link between L2 and concepts to reduce mediation through L1. Here, each of those propositions is addressed separately in the forthcoming sections. Relevant research studies are drawn on to illustrate the three areas of SAM's potential application. Also, a number of suggestions about distinct teaching/learning methods are offered. Since the magnitude of shared elements is greater than that of language/culture specific ones (Dong et al., 2005), the discussion will be initiated by presenting ways of teaching common conceptual items.

1. Teaching Vocabulary that Shares Concepts between L1 and L2

In principle, to learn vocabulary that shares concepts between L1 and L2 one could rely on paired-associate learning (Malt & Ameel, 2011). For example, a Chinese learner of English would need to make simple associations between L1 and L2 such as *zhuōzi* (桌子) = *table* and *píngguǒ* (苹果) = *apple*. This view is supported to some degree by Jiang 2000, who

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explained that "in first language development, the task of vocabulary acquisition is to understand and acquire the meaning as well as other properties of the word. In tutored L2 acquisition, the task of vocabulary acquisition is primary to remember the word" (p. 50). Paired-associate learning can be successful, but it can only be applied to a small set of prototypical terms because, as demonstrated by Malt & Ameel (2011), the meanings of concrete nouns (e.g. common household artifacts) do not correspond closely across languages. For instance, Chinese speakers use a single word to name 40 different items that English speakers distinctly refer to as a *jar, bottle,* and a *container* (Jared et al., 2013). Additionally, Sonaiya (1991) stated that "[…] a pair of conceptually identical languages have not yet been shown to exist" (p. 275). Hence, learning word meaning in L2 does not only consist of rote memorisation of labels that can be matched with already existing concepts in L1. That is, the process of vocabulary acquisition involves ongoing refining of meaning and readjustment of boundaries between already acquired and new lexical items (Sonaiya, 1991). As Pavlenko (2011) articulates, L2 learning is dynamic and "constitutes a process of re-naming the world" (p. 199). Therefore, paired-associate learning may not be sufficient to turn learners' attention to all the nuances of particular lexical items.

Based on the notion of *conceptual equivalence*[1]*,* Pavlenko (2009) advocated use of different language teaching methods. He proposed that, in the case of *conceptual equivalence*, L2 production tasks, translation from L1 to L2, recall of L2 words, and metaphoric extensions of given words should be used for strengthening the links between L2 words and their L1 translation equivalents. In the case of *partial (non-)equivalence*, she suggested using tasks that would highlight areas of similarities and differences. Exercises such as naming, sorting, and categorization should help students to understand native-like usage and in general aid conceptual restructuring to take place.

Similarly, Jiang (2000) divided words into three categories depending on the degree of semantic overlap. He differentiated between: *real friends, false friends* and *strangers.* The first term, *real friends* describes words in L2 that have a high degree of semantic overlap with their translation equivalents in L1, whereas *false friends* refers to words that have a translation equivalent but the degree of meaning overlap is not extensive. *Strangers*[2], in turn, refer to those terms in L2 that do not have translation equivalents; in other words, whose

[1] Pavlenko (2009) differentiated between *conceptual equivalence, partial (non-)equivalence,* and *conceptual non-equivalence*. This differentiation reflects upon the degree towards which concepts are shared in two languages.ß

[2] The notion of *strangers* as well as *conceptual non-equivalence* is dealt with in the next section of this note.

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concepts are language/culture specific. In Jiang's opinion, *real friends* should be fairly easy to learn as they can rely on the 'walking stick' of L1 translations. To put it differently, the semantic content is readily available in L1 and it can be copied into the L2 lexical entry. When it comes to the false friends, Jiang contended that the process of noticing a semantic mismatch is very important as it is the first stage in creating new semantic content that is specific to L2 words. He used the example of the English word *support* to clarify this point. The translation equivalent *zhīchí (*支持) is only used in the abstract form in Chinese, i.e. in a sentence such as *'I support you being elected.'* In English however, the word *support* is also used in a concrete or physical sense as in the following sentence *'We need something to support the wall'* (Jiang, 2000, p. 68). These differences in usage motivate students to pay attention to the context and the specificity of words. Thus Jiang (2004) stressed the importance of using vocabulary instruction techniques that draw students' attention to semantic similarities and differences between words in L1 and L2. He suggested using explicit instruction and contrastive analysis to help learners better understand the meaning of words.

Furthermore, Jullian (2000) observed that words might have specific meanings or different semantic loads and devised an activity to help students gain word meaning awareness. The proposed task can be organised into several stages that draw learners' attention to the full semantic content of a given word. The task consists of working with dictionary definitions and making associations between semantically related items. It starts with the selection of a leading word followed by the collection of a lexical set, i.e. other related words. For example, a lexical set for the leading word *hit* would contain words such as: *strike, beat, batter, knock, bang, punch,* etc. Once a lexical set has been prepared, students are required to perform several activities with it, e.g. (1) to classify the words according to given attributes (e.g. words that describe hitting accidentally or deliberately, or hitting with a part of the body); (2) to create a semantic word map around the leading word (an example of such a network is given in Figure 2); (3) to use the words in context (e.g. finding collocations, using illustrative sentences or unconventional sentences, providing metaphorical extensions); (4) to conduct individual research on selected words and to provide findings to the classroom. This method has many advantages. For example, it allows students to understand the semantic content in a comprehensive way in terms of associations with other related words as well as appropriate use in context. It gives them the opportunity to familiarise themselves with a wide scope of vocabulary and also to become independent researchers of the

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intricacies of studied words. Furthermore, a teacher has the flexibility to choose how long or short the activity should be. The task can be very detailed and involve several sessions or it can be used as a warm up at the beginning of a class in a curtailed form. Certainly, this type of activity is more attractive to students than rote memorisation of a list of vocabulary items.

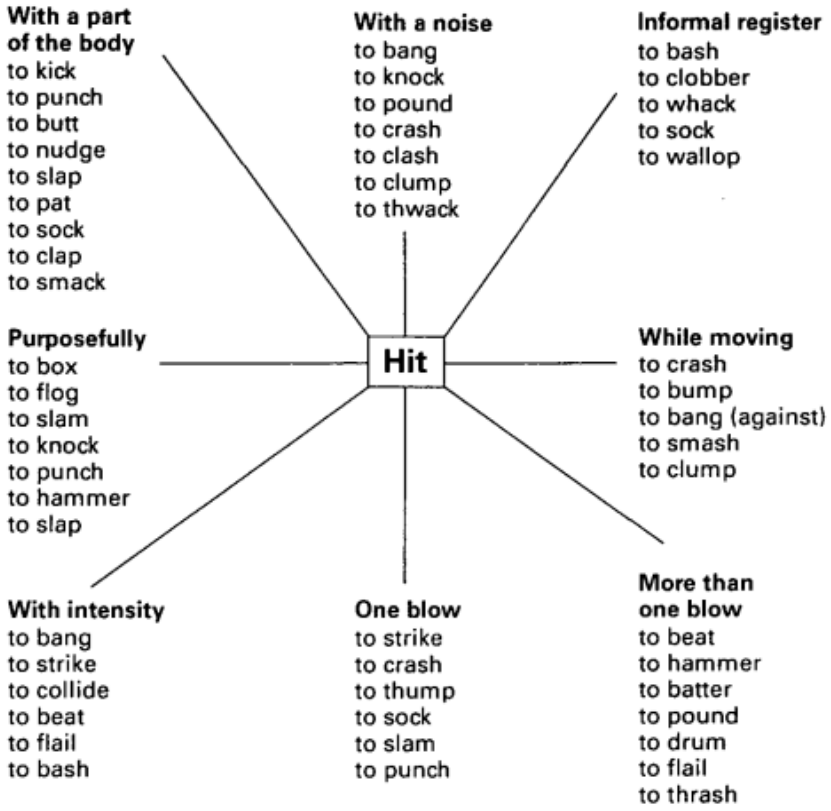

Figure 2. An example of a semantic word map (Jullian, 2000, p. 41)

To conclude this section, learners of L2 need to have an understanding that even those concepts that share translations equivalents across L1 and L2 do not fully share their semantic content and often retain their specific meanings. The use of activities, such as the one designed by Jullian (2000), can help students gain linguistic competence in two languages.

2. Teaching Vocabulary That Has Language/Culture Specific Meaning

Teaching vocabulary that has language/culture specific meaning seems more challenging than teaching words that at least partially share semantic content between two languages. That is, in case of language specific words it is not possible to rely on translation or an association in L1. One can use approximation (e.g. A is like B or A is similar to B),

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however, it is not a reliable method. For example, if one relies on approximation and explains that a red envelope (红包 hóngbāo) is like an envelope but red in colour and it is used during Chinese New Year, students may not comprehend the full semantic load of the concept. Red envelopes tend to be smaller in size, open along the shorter edge, have traditional gold decorative elements and are used not for sending letters but for offering gifts of money to children during Chinese New Year. Therefore, when learning L2 vocabulary that does not have counterparts in L1, apart from acquiring the orthography, phonology and morphology, one has to create a new meaning. This process, according to Jiang (2000), might take a while since first learners have to understand the new concept before they are able to use it successfully. For instance, Chinese learners struggle with the English words for *privacy* and *community* as these concepts do not exist in Chinese (Jiang, 2000, p. 67). The Chinese word *yǐnsī* (隐私), which is often translated as *privacy,* actually stands for *private matters*; whereas *shèqū* (社区) means *neighbourhood* rather than *community.* Furthermore, Pavlenko (2009) pointed out that words such as *privacy, personal space* or *frustration* do not have conceptual equivalents in Russian. Also, for instance Polish words: *przykro mi*[3] or *obrazić się*[4] do not seem to have equivalent concepts in English. Therefore, in case of *conceptual non-equivalence*, Pavlenko recommended using tasks that facilitate the development of new concepts. For instance, activities such as the presentation of novel objects or awareness-raising discussions are seen by the researcher as very useful. Also, referring back to the above, Jiang (2000) stated that acquisition of *strangers* involves a process of meaning creation. However, once this process is complete, *strangers* can be used with greater automaticity and correctness than *real* and *false friends*.

Therefore, to teach language/culture specific vocabulary one should use a wide variety of teaching aids. In the case of concrete words, it may be valuable to use realia or pictorial representations of new lexical items. In general, there are not many concrete vocabulary items that can only be found in one language and not another as we all live in a natural environment and we are surrounded by similar natural features and man-made objects. For instance, a dining table might have a slightly different shape in the U.K. (usually square

[3] It refers to a state of experiencing/feeling sorry or sad after something unpleasant happened. The way in which the emotion is expressed focuses one's attention to the process of undergoing/experiencing a given state, a dynamic experience rather than a static one, which is denoted by semi-translation equivalents available in English. The expression in English 'to feel sorry' does not capture the full scope of the experienced state.
[4] It refers to a state/feeling after e.g. an argument, when one person does not want to talk with another person because they feel angry, sad, disappointed. The English expression 'to take offence' is not fully equivalent to what the Polish expression denotes.

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or rectangular) and China (usually round with a round rotating glass board in the middle) but it still serves the same purpose. In the case of concrete words, it is often the extension of meaning (metaphorical or figurative use) or connotations that differ, as for instance exemplified by Dong et al. (2005). Discussions, working with definitions, use in context, and use of concrete examples are among just a few methods that can help students learn such specific instances of vocabulary use. For example, to teach students about the different connotations that various colours carry in Chinese and English one could present pictures taken during a traditional Chinese wedding or a Chinese New Year to explain the vast scope of specific connotations that e.g. the colour red carries[5] in Chinese and compare them with photos of fire or an English fire engine. The above mentioned activities can also be helpful in teaching abstract words. For instance, the short movies used by Pavlenko in her research could easily be adapted to teaching tools to visualise the notions of *privacy* and *personal space.*

To sum up this section, instruction focusing on language/culture specific vocabulary has to be rich and detailed in order to facilitate formation of new concepts and assure appropriate usage in context. Several of the suggestions, e.g. using realia, discussions, use of words in context, that were made above can be beneficial in this process.

3. Strengthening the Interlexical Link Between L2 and Concepts

It has been demonstrated by e.g. Jiang (1999) and Dong et al. (2005), that the link between L2 and concepts is weaker than the one connecting L1 and concepts as exemplified by the SAM. This means that often, especially during early stages of L2 learning, students rely on mediation through L1 to access the meaning of L2 words. They translate L2 word into L1 word before accessing the meaning of it. Access from L2 to concepts is more direct and faster, therefore strategies for strengthening the link between L2 and concepts should be considered. The most obvious way to do this is to eliminate the use of L1 from the teaching context. This notion was already suggested over a century ago by Epstein (1915; as cited in Pavlenko 2011, p. 12) who promoted the use of the Direct Method. According to Epstein this method of teaching "assists the formation of direct links between 'thought' and L2 words [and] eliminates translation exercises and the mother tongue of the pupils from the classroom." As indicated by Pavlenko (2011), this method was later adopted by immersion approaches.

[5] Red in Chinese culture means good luck, good fortune, prosperity, happiness and joy. Brides wear traditional red dresses during the wedding. Children receive red pockets (envelopes) with money and people wear red clothes during the Chinese New Year.

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Kroll and Sunderman (2003, p. 122) also recalled a number of second language teaching methods that stress the importance of L1 elimination from a language classroom. The communicative second language classroom, Direct method (Epstein, 1915), Total Physical Response (Asher, 1977), and Natural approach (Terrell, 1986) are among some of the methods that emphasise the benefits of relying on L2 and building a direct link between L2 and concepts. Nevertheless, Jiang (2004) argued that even though intralingual strategies[6] are preferred among teachers and are seen as 'pedagogically correct'[7] (Schmitt, 1997), they are not beneficial for the students, for use of only L2 often involves inferring new meanings from context.

As Jiang (2004) notes, there is a lot of research demonstrating that guessing is frequently unsuccessful and it may lead to lexical errors. On the other hand, use of L1 translation is often quick and efficient. It gives students confidence in learning new meanings; it also helps them to make associations with already existing (in most cases) concepts in L1 and therefore new words are easier to retain regarding their semantic content in the long term memory. Furthermore, Jiang (2004) argued that L1 involvement in L2 learning cannot be avoided as often L2 words are mapped to the semantic content of L1 semantic structures (at least in adult learners) and therefore "there is no reason not to use L1 as a means of semantization or as a tool for checking and validating learners' understanding of word meaning" (p. 426).

In conclusion, the use of L1 translation should not be seen as having a detrimental effect on students' lexical competence. The use of intralingual strategies to strengthen the interlexical connections between L2 and concepts can be successful but only at more advanced stages of learning. Once students have acquired sufficient knowledge of L2, they can rely on monolingual dictionaries, use of synonyms and L2 context to gain new semantic content. Moreover, retaining a strong link between L1 and L2 is important as proficient translation between two languages is a valuable skill.

[6] Jiang (2004) made a distinction between intralingual (use of only L2 instruction), interlingual (use of both L1 and L2 instruction), and extralingual (pictures, object, multimedia) strategies.
[7] Schmitt (1997) explained that many teachers see intralingual strategies as being in line with the communicative approach to teaching.

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Discussion

The present review demonstrated that distinct teaching/learning methods should be utilised by teachers and language learners to acquire shared, language/culture specific concepts and to increase the reliance on the L2 and concepts connection, as a way of reducing mediation through L1. It has been suggested that while teaching shared concepts, tools such as translation from L1 to L2, naming, sorting, categorization, explicit instruction and contrastive analysis should be employed to direct students' attention to the nuances of conceptual information that might not be equivalent between languages (Jiang, 2000; Pavlenko, 2009). With regard to language/culture specific concepts, the reliance on discussions, working with definitions, use of words/phrases in context, and use of concrete examples (realia or pictorial representations) may aid the acquisition of new meaning alongside other lexical pieces of information (e.g. spelling, pronunciation, etc.). Finally, when it comes to strengthening the direct access from L2 to concepts, eliminating use of L1, e.g. translation from L2 to L1, could be helpful. At the same time, such reliance on L1 might act as a beneficial tool of systematising knowledge, especially in case of students at early stages of L2 acquisition. This distinction illustrates that the applicability of bilingual memory models, here the Shared Asymmetrical Model (Dong et al., 2005), to SLL instruction is possible and necessary. Thus, despite lack of conclusive findings regarding the conceptual level of representation and the opposing findings, the educational implications of psycholinguistic experimentation should be discussed to reduce the gap between theory and practise. Nevertheless, the present review is purely theoretical. It summarises findings obtained by other researchers in a form of a mini meta-analysis to illustrate the distinctions between concepts and the importance of utilising variety of teaching methods. However, to take our understanding of this issue further, it would be necessary to conduct a series of experiments. Such experiments should follow the learning process of several groups of L2 learners with varying language instruction and specific focus on shared versus language/culture specific concepts. The study could be designed in a form of an intervention with experimental and control groups of participants that could be tested on two occasions, before and after undergoing a specific treatment, i.e. language training. The pre-test post-test research design offers a valid comparison and can potentially generate data in favour of varied language instruction to teach shared and language/culture specific concepts. However, this is yet to be investigated. The present review is an attempt to demonstrate that "translation equivalents are not always conceptual equivalents" (Pavlenko, 2009, p. 133). This important

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message should therefore also be reflected in the teaching methods employed in a second language-learning environment.

Conclusion

The applicability of bilingual memory models to second language learning has not been a part of psycholinguistic investigations. This might be due to the conflicting findings available in the field and lack of conclusive statements regarding the way in which two languages are stored in a bilingual memory. However, as presented above, it is possible to consider several plausible scenarios of using differing teaching methods, which resemble the representation of concepts in memory. As stated by Kroll and Sunderman (2003), "if we begin to understand what it is that allows one to become a proficient bilingual, we can then re-evaluate our teaching methodologies and attempt to modify them to facilitate the developmental process" (p. 125). This topic certainly is a promising avenue for future research investigations.

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